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Classics in physical geography revisited

Grove, A.T. 1958: The Ancient Erg of Hausaland, and similar formations on the south side of the Sahara. *Geographical Journal* 124, 528–33.

The apparent geographical specificity and somewhat old-fashioned air of the title might lead one to believe that this short article had limited general appeal and that it lacked originality. Indeed, Grove's first sentence might itself encourage one to believe that the article would have little that was radical to say. As he remarked, modestly but correctly, 'It has been recognised for several decades that the sandy drift covering much of Northern Nigeria is formed into low rounded ridges, and that these are ancient dunes bearing witness to the former prevalence of desert conditions.' (p. 528). Grove cites, for example, the previous studies undertaken by, *inter alia*, Tricart and Brochu, Urvoy and Capot-Rey, in what was then French West Africa. It is also true that in some other parts of the world the existence of ancient ergs and other aeolian relics had long since been noted, as, for example, by Price in the USA (Price, 1944).

Why therefore is Grove's article a classic? First, it contains a map showing both the longitudinal and latitudinal spread of fixed dunes in relation to mobile dunes. It covers a huge swathe of country from the Atlantic to the Red Sea, and indicates that active dunes are bounded by the 150 mm isohyet whereas the fixed dunes are bounded in the south by the 1000 mm isohyet. It is the shear geographical spread of fixed dunes and the shift in precipitation patterns that, it implies, that had never before been so strikingly portrayed. Secondly, Grove indicated the immense value of air photographs for identifying and mapping ancient ergs, and this was something that he and his graduate students were to pursue in subsequent years (e.g., Grove and Warren, 1968; Grove, 1969). Thirdly, utilization of ancient sand formations for identifying the degree of climatic change that

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has taken place in low latitudes was subsequently extended to many other parts of the world, including South America (Clapperton, 1993), India (Allchin *et al*., 1978) and Australia (Mabbutt, 1971). Fourthly, Grove's recognition that many tracts of dryland had in the past been very substantially more arid than today was a major revelation and corrective to those who had been brought up to believe in the power of postglacial progressive desiccation (see Goudie, 1972, for a review) and that glacials in high latitudes were contemporaneous with pluvials in low latitudes. As Grove pointed out presciently in his conclusion, 'there is still no certainty that the tropical pluvials were in fact contemporaneous with the glacial periods; it is not clear whether the deserts shrank or shifted towards the equator as the ice advanced' (p. 532). So, as Vita-Finzi (1996: xx) has recently remarked, 'The Ancient Erg of Hausaland, which is an excellent account of what palaeoclimatology stands to gain from regional analysis of shifts in wind direction, included a bold map of dunefields which, like the crescents that are said to scar the retinas of those who have gazed at a solar eclipse, has doubtless benevolently scarred many impressionable minds'.

The details of Grove's 'bold map' have been filled in by others (e.g., Völkel and Grunert, 1990; Nichol, 1991), but its general validity has been confirmed. What has perhaps not proved universally acceptable have been attempts to use fixed dunes as quantitative indicators of past shifts in precipitation amounts. Whether or not dunes are fixed or mobile depends not only on levels of precipitation but also on such factors as windiness, fire, and availability of sand supply from fluvial and other sources. Moreover, there is some debate about the relationship between dune mobility and degree and type of vegetation cover (Livingstone and Thomas, 1993). That said, it is not possible to account for the presence of ancient ergs in the Kimberley District of northwestern Australia (Goudie *et al*., 1991), at the Victoria Falls in central Africa or in the forests of South America, without invoking the sort of precipitation change that Grove suggested as being necessary in West Africa.

Grove's unwillingness to accept the synchroneity of glacial and pluvial has proved to be sage indeed. He was writing in the very early days of isotopic dating and three decades or so before thermoluminescent and optical dating techniques were applied routinely to dating aeolian materials. The use of such techniques has burgeoned in the last few years and now enables us to recognize the complex histories that ancient ergs have enjoyed in both the Pleistocene and the Holocene (Stokes *et al*., 1997; Thomas *et al*., 1997).

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